CLAIMS:

1. A bipolar transistor comprising
- a collector region (1) with a first doping type,
- a base region (2) with a second doping type,
- and an emitter region (3) with the first doping type,
- a junction (4) being situated between the emitter region (3) and the base region (2), and, viewed from said junction (4), a depletion region (5) extending in the emitter region (3),
- and, said emitter region (3) comprising a layer (6) of a first semiconductor material and a layer (7) of a second semiconductor material,

characterized in that the intrinsic carrier concentration of the second semiconductor material exceeds the intrinsic carrier concentration of the first semiconductor material, the layer (7) of the second semiconductor material is situated outside the depletion region (5), and the second semiconductor material is doped such that Auger recombination occurs.

2. A bipolar transistor as claimed in claim 1, characterized in that the second semiconductor material has a composition that is at least substantially constant over at least a part (8) of the layer (7).

3. A bipolar transistor as claimed in claim 1 or 2, characterized in that the first semiconductor material comprises at least predominantly silicon, and the second semiconductor material comprises a composition of silicon and germanium.

4. A bipolar transistor as claimed in claim 1, 2 or 3, characterized in that the layer (7) has a doping with a doping concentration of at least 3×10^{20} cm^{-3}.

5. A bipolar transistor as claimed in claim 3, characterized in that the percentage of germanium in the composition is below 30%.

6. A bipolar transistor as claimed in claim 1, 3 or 4, characterized in that the layer (7) has a thickness (9) which, viewed perpendicularly from the junction, is above 3 nm.

7. A bipolar transistor as claimed in claim 1, characterized in that the emitter region (3) has an emitter contact (10), and the layer (7) with the second semiconductor material is at least substantially adjacent to the emitter contact (10).

8. A semiconductor device (11) comprising a semiconductor body (12) of the first semiconductor material, and provided with a bipolar transistor as claimed in any one of the preceding claims 1 through 7.

9. A method of manufacturing a bipolar transistor comprising a collector region (1) with a first doping type, and a base region (2) with a second doping type on which an emitter region (3) with a first doping type is formed, the emitter region (3) comprising a layer (6) of a first semiconductor material and a layer (7) of a second semiconductor material, characterized in that the emitter region (3) is formed by epitaxially providing a first layer (6) of the first semiconductor material, after which a second layer (7) of the second semiconductor material is subsequently epitaxially provided and doped with a first doping type such that Auger recombination occurs, and the intrinsic carrier concentration of the second semiconductor material exceeds the intrinsic carrier concentration of the first semiconductor material.

10. A method as claimed in claim 9, characterized in that the composition of the second semiconductor material on the second layer (7) is at least substantially constant.

11. A method as claimed in claim 9 or 10, characterized in that the first semiconductor material provided comprises at least substantially silicon, and the second semiconductor material provided comprises a composition of silicon and germanium.

12. A method as claimed in claim 9, 10 or 11, characterized in that the doping provided in the second layer (7) has a doping concentration above 3×10^{20} cm^{-3}.

13. A method as claimed in claim 9, 10 or 11, characterized in that the second layer (7) of the second semiconductor material is doped in situ with a first doping type during the epitaxial growth process.

14. A method as claimed in claim 9, 10, 11 or 12, characterized in that an emitter contact (10) is formed on the emitter region (3) by providing a polysilicon layer (16) with a first doping type on the emitter region (3), and the second layer (7) is doped by outdiffusion of the doping atoms from the polysilicon layer (16).

15. A method as claimed in claim 11, characterized in that the percentage of germanium in the composition is chosen to be smaller than 30%.

16. A method as claimed in claim 9, characterized in that the thickness of the second layer (7) is chosen to be above 3 nm.

17. A method of manufacturing a semiconductor device (11) comprising a semiconductor body (12) of the first semiconductor material, provided with a bipolar transistor manufactured in accordance with the method as claimed in claims 9 through 16.